UV·BioTAG™ FAQs

Microbiologics

What is UV-BioTAG?

UV-BioTAG™ is a lyophilized reference stock culture preparation containing a single strain of a microorganism. The microorganism contains a Green Fluorescent Protein (GFP) that is visible under UV light when the microorganism is cultured.

What is GFP?

GFP is green fluorescent protein.

Is the UV-BioTAG GFP stable?

The GFP reporter used for UV-BioTAG strains has been integrated into the chromosome to provide superior stability over plasmid-based reporters which may be lost during enrichments designed to recover pathogens from food.

What makes UV-BioTAG useful for quality control?

The ability of UV-BioTAG to fluoresce distinguishes it from pathogens found in food and at manufacturing sites. It establishes that positive results were not caused by cross-contamination with the positive control.

Are false positives a problem for the food industry?

A retrospective study of nearly 40,000 proficiency results over a 14 year period from 1999 to 2012 showed the false positive rate for *Salmonella* was 3.9% and 2.5% for *E. coli* and *L. monocytogenes*. The study, *"Pathogen Detection in Food Microbiology Laboratories: An Analysis of Proficiency Test Performance"* was conducted by the American Proficiency Institute (API), a private institute that provides proficiency testing programs for food and clinical laboratories.

How can I confirm a microorganism isolated from a food sample is not the UV-BioTAG control?

If the microorganism does not fluoresce on Tryptic Soy Agar or other appropriate agar, you can assert that is not UV-BioTAG.

What are the applications for UV-BioTAG?

- Enumeration methods
- Detection methods
- Demonstration of Capability (DOC)
- Media QC
- Verification and validation
- FDA Bacteriological Analytical Manual Chapters 4,5,6,8,9,10,29
- USDA Microbiology Laboratory Guidebook Methods 5C.01 and 8.11

From what reference culture collection does Microbiologics obtain the UV-BioTAG microorganisms?

Microbiologics obtained the fluorescent strains used to make UV-BioTAG from the Food and Drug Administration (FDA).

Strain Resistance

Microorganism Strain	Strain Resistance
***Escherichia coli* (O157:H7) EC43 (STEC)**	Resistant to Chloramphenicol
Listeria innocua (6a)	Resistant to Erythromycin
***Listeria monocytogenes* (1/2a)**	Resistant to Erythromycin
***Listeria monocytogenes* (1/2b)**	Resistant to Erythromycin and Rifampicin
***Listeria monocytogenes* (4b)**	Resistant to Erythromycin and Streptomycin
***Shigella flexneri* SF84**	Resistant to Chloramphenicol
***Shigella sonnei* SS61**	Resistant to Chloramphenicol
***Salmonella enterica* subsp. *enterica* serovar Gaminara SAL57**	Resistant to Chloramphenicol
***Salmonella enterica* subsp. *enterica* serovar Mbandaka SAL58**	Resistant to Chloramphenicol
***Salmonella enterica* subsp. *enterica* serovar Minnesota SAL60**	Resistant to Chloramphenicol
***Salmonella enterica* subsp. *enterica* serovar Senftenberg SAL59**	Resistant to Chloramphenicol
***Salmonella enterica* subsp. *enterica* serovar Typhimurium SAL46**	Resistant to Chloramphenicol
***Salmonella enterica* subsp. *enterica* serovar Typhimurium SAL54**	Resistant to Chloramphenicol

Which Microbiologics strains are available in UV-BioTAG?

The following UV-BioTAG strains are available:

Microorganism Strain	Source	Catalog # 6-Swab Kit	Catalog # 6-Vial Kit
***Escherichia coli* (O157:H7) EC43 (STEC)**	Derived from FDA ESC1177	01227UV-S	01227UV-V
***Cronobacter sakazakii* G-78**	Derived from G-56	01287UV-S	01287UV-V
***Salmonella enterica* subsp. *enterica* serovar Typhimurium SAL54**	Derived from FDA SAL5694	01223UV-S	01223UV-V
***Salmonella enterica* subsp. *enterica* serovar Typhimurium SAL46**	Derived from FDA SAL5693	01277UV-S	01277UV-V
***Salmonella enterica* subsp. *enterica* serovar Senftenberg SAL59**	Derived from FDA SAL5697	01226UV-S	01226UV-V
***Salmonella enterica* subsp. *enterica* serovar Gaminara SAL57**	Derived from FDA SAL5695	01278UV-S	01278UV-V
***Salmonella enterica* subsp. *enterica* serovar Mbandaka SAL58**	Derived from FDA SAL5696	01230UV-S	01230UV-V
***Salmonella enterica* subsp. *enterica* serovar Minnesota SAL60**	Derived from FDA SAL5698	01228UV-S	01228UV-V
***Salmonella enterica* subsp. *enterica* serovar Nottingham SAL93**	Derived from FDA SAL87	01282UV-S	01282UV-V
***Salmonella enterica* subsp. *enterica* serovar Abaetetuba SAL75**	Derived from FDA SAL72	01279UV-S	01279UV-V
***Salmonella enterica* subsp. *enterica* serovar Tranoroa SAL91**	Derived from FDA SAL86	01281UV-S	01281UV-V
***Salmonella enterica* subsp. *enterica* serovar Bispebjerg SAL89**	Derived from SAL84	01280UV-S	01280UV-V
***Shigella flexneri* SF84**	Derived from FDA SHI0552	01224UV-S	01224UV-V
***Shigella sonnei* SS61**	Derived from FDA SHI0551	01276UV-S	01276UV-V
***Vibrio cholerae* serovar O139 G-106**	Derived from G-101	01286UV-S	01286UV-V
***Yersinia enterocolitica* G-85**	Derived from G-40	01284UV-S	01282UV-V
***Yersinia enterocolitica* G-79**	Derived from G-39	01285UV-S	01285UV-V
***Klebsiella aerogenes* G-126**	Derived from G-32	01283UV-S	01283UV-V
***Listeria monocytogenes* (1/2a)**	Derived from FDA LS808	01249UV-S	01249UV-V
***Listeria monocytogenes* (1/2b)**	Derived from FDA LS810	01248UV-S	01248UV-V
***Listeria monocytogenes* (4b)**	Derived from FDA LS806	01250UV-S	01250UV-V
Listeria innocua (6a)	Derived from NCTC 11288	01271UV-S	01271UV-V

On which agars will UV-BioTAG microorganisms fluoresce?

UV Bio-TAG strains fluoresce on the following agars:

Microorganism Strain	Catalog #	Growth
***Escherichia coli* (O157:H7) EC43 (STEC)**	01227	– Tryptic Soy Agar – Tryptic Soy Agar with 5% Sheep Blood Agar – LB Agar with Chloramphenicol – MacConkey Sorbitol – Hektoen Enteric (HE) Agar – Xylose Lysine Deoxycholate (XLD) Agar
***Yersinia enterocolitica* G-85** ***Yersinia enterocolitica* G-79**	01284 01285	– MacConkey Agar – Celfsulodin-irgasan-novobiocin (CIN) Agar – Tryptic Soy Agar with 5% Sheep Blood
***Cronobacter sakazakii* G-78**	01287	– DFI Chromogenic Agar – Tryptic Soy Agar with 5% Sheep Blood
***Klebsiella aerogenes* G-126**	01283	– L-EMB – VRBA – Tryptic Soy Agar with 5% Sheep Blood
***Vibrio cholerae serovar* O139 G-106**	01286	– Tryptic Soy Agar with 5% Sheep Blood Agar (SBAP) – Thiosulfate citrate bile salts sucrose (TCBS) agar – Modified Cellobiose polymyxin colistin (MCPC) agar

***Salmonella enterica* subsp. *enterica* serovar Typhimurium SAL54**	01223	– Tryptic Soy Agar – Tryptic Soy Agar with 5% Sheep Blood Agar – LB Agar with Chloramphenicol – Hektoen Enteric (HE) Agar – Xylose Lysine Deoxycholate (XLD) Agar
***Salmonella enterica* subsp. *enterica* serovar Typhimurium SAL46**	01277	
***Salmonella enterica* subsp. *enterica* serovar Senftenberg SAL59**	01226	
***Salmonella enterica* subsp. *enterica* serovar Gaminara SAL57**	01278	
***Salmonella enterica* subsp. *enterica* serovar Mbandaka SAL58**	01230	
***Salmonella enterica* subsp. *enterica* serovar Minnesota SAL60**	01228	
***Salmonella enterica* subsp. *enterica* serovar Nottingham SAL93**	01282	
***Salmonella enterica* subsp. *enterica* serovar Abaetetuba SAL75**	01279	
***Salmonella enterica* subsp. *enterica* serovar Tranoroa SAL91**	01281	
***Salmonella enterica* subsp. *enterica* serovar Bispebjerg SAL89**	01280	
***Shigella flexneri* SF84**	01224	
***Shigella sonnei* SS61**	01276	
***Listeria monocytogenes* (1/2a)** ***Listeria monocytogenes* (1/2b)** ***Listeria monocytogenes* (4b)**	01249 01248 01250	– Tryptic Soy Agar – Tryptic Soy Agar with 5% Sheep Blood Agar – Modified Oxford (MOX) Agar – ALOA Agar (Selective chromogenic medium for the detection of Listeria)
***Listeria innocua* (6a)**	01271	– Tryptic Soy Agar – Tryptic Soy Agar with 5% Sheep Blood Agar

What equipment do I need to see a UV-BioTAG culture fluoresce?

You need a UV lamp and a dark room. UV-BioTAG strains are best visualized using a 315-400 UV Light Wavelength, with the exceptions list below:

Microorganism Strain	UV Light Wavelength
Listeria monocytogenes (1/2a)*	475 – 495 nm
Listeria monocytogenes (1/2b)*	475 – 495 nm
Listeria monocytogenes (4b)*	475 – 495 nm
Listeria innocua (6a)*	475 – 495 nm

**Listeria monocytogenes strains are best visualized using blue light barrier lenses. We have confirmed the fluorescent expression of UV-BioTAG L. monocytogenes strains using the commercially available UV lights and blue light barrier glasses listed below. However, we expect any 475 – 495 nm UV light will adequately produce the fluorescence for UV-BioTAG Listeria strains when viewed with any blue light barrier glasses.*

Blue Light Barrier Glasses: *Uvex Skyper Blue Light Blocking Computer Glasses with SCT-Orange Lens*
Blue Wavelength UV Light: *LED Wholesalers Crime Scene Blue LED Flashlight 455 – 460 nm*
Xite-RB Light and FG-RB-2 Glasses Set: *NightSea Xite Fluorescence Flashlight System*

Are all media and test processes suitable for UV-BioTAG?

Some processes or matrices may produce biochemical by-products that mask fluorescence. Also some broths and agars emit fluorescence that may mask UV- BioTAG fluorescence. Check your media for fluorescence before inoculating with UV-BioTAG.

How can I use UV-BioTAG for quality control of tests for pathogen detection?

- Grow the microorganism on nonselective agar
- Inoculate enrichment broth with the UV-BioTAG strain
- Subculture the broth to Tryptic Soy Agar or another agar which it is known to fluoresce on
- Check for fluorescence
- For more details see the Instructions for Use found at www.microbiologics.com.

Will UV-BioTAG microorganisms retain their fluorescence when they are subcultured?

UV-BioTAG microorganisms will retain their fluorescence for one month if the Microbiologics Microorganism Maintenance Plan is followed. For best results start a new culture with each test.

Can I freeze UV-BioTAG?

Microbiologics does not guarantee a UV-BioTAG strain will retain its unique characteristics if it is frozen.

What are the components of UV-BioTAG?

A UV-BioTAG lyophilized preparation consists of:

- The microorganism population
- Skim milk (Bovine – USA origin)
- Carbohydrate
- Gelatin (Porcine – USA or Canada origin)
- Ascorbic acid

How is UV-BioTAG packaged?

UV-BioTAG is available in two formats:

- UV-BioTAG Swab kits include six swabs, each containing one lyophilized pellet of an individual microorganism strain
- UV-BioTAG Vial kits include six vials, each containing one lyophilized pellet of an individual microorganism strain.

Where can I find the Instructions for Use, Safety Data Sheets (SDS) and Certificates of Analysis?

All documents and certificate are available on our website at microbiologics.com.